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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,539	01/23/2006	Oliver Steffen Henze	284214US0PCT	2094
22850	7590	09/14/2009	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			GILLESPIE, BENJAMIN	
			ART UNIT	PAPER NUMBER
			1796	
			NOTIFICATION DATE	DELIVERY MODE
			09/14/2009	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/565,539	<b>Applicant(s)</b> HENZE ET AL.	
	<b>Examiner</b> BENJAMIN J. GILLESPIE	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-9,12-14 and 17-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-9,12-14 and 17-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/6/2009 has been entered.

***Claim Rejections - 35 USC § 102***

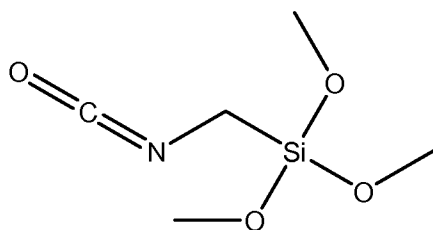
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-2, 6, 12-14, and 21-22** are rejected under 35 U.S.C. 102(b) as being anticipated by Satokichi et al (JP 11-228833).
3. **Regarding claims 1 and 6:** Satokichi et al teach moisture-curable, silane modified, thermoplastic polyurethane as well as a method for its production, wherein a (A) thermoplastic polyurethane is reacted with a (B) silane having an isocyanate groups (Abstract).
4. **Regarding claims 2 and 12-14:** Component (B) comprises gamma-isocyanato propyltrimethoxysilane and/or gamma-isocyanatopropyl triethoxysilane (Bottom of paragraph 39).
5. **Regarding claims 21 and 22:** Satokichi et al teach that the silane modified polyurethane comprises between 0.5 to 5 wt% of (B) – this coincides with applicants' claimed range when using the preferred isocyanate-functional silane compounds of Satokichi et al:

Chemical Formula:  $C_5H_{11}NO_4Si$   
Exact Mass: 177.05  
Molecular Weight: 177.23



isocyanatomethyltrimethoxysilane

- a.  $0.001 \text{ mol} * 177.23 \text{ g/mol} = .17723 \text{ grams}$
  - b.  $.01 \text{ mol} * 177.23 \text{ g/mol} = 1.7723 \text{ grams}$
  - c.  $0.2 \text{ mol} * 177.23 \text{ g/mol} = 35.446 \text{ grams}$
6. Therefore, using these amounts of component (B) with 100 grams of thermoplastic polyurethane:
- a. @ 0.001 mol:  $0.17723 / (100 + .17723) = 0.18 \text{ wt\%}$
  - b. @ 0.01 mol:  $1.7723 / (100 + 1.7723) = 1.74 \text{ wt\%}$
  - c. @ 0.2 mol:  $35.446 / (100 + 35.446) = 26.2 \text{ wt\%}$
7. Applicants' claimed mole range corresponds to a wt% range of
- a. Claim 21: **0.18 wt% to 26.2 wt%** and
  - b. Claim 22: **1.74 wt% to 26.2 wt%**,
8. Which the disclosed range: 0.5 to 5 wt% falls coincides with.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 1796

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

#### **Obviousness Rejection I**

10. **Claims 4-5 and 8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Satokichi et al (JP 11-228833) in view of Mowrer et al (U.S. Patent 5,760,155).

11. **Regarding claims 4 and 8-9:** Aforementioned in paragraph 3, Satokichi et al teach silane functional thermoplastic polyurethane that is moisture curable, wherein said polyurethane, after curing, exhibits “excellent weatherability”, however, Satokichi et al fail to disclose the modified polyurethane extruded into hoses or cable sheathing (Paragraph 61).

12. Mowrer et al also teach modified polyurethane having terminal silane groups, wherein said polyurethane is cured through exposure to moisture (Abstract). Since the polymer cures by hydrolysis of the alkoxysilane end groups, there is less carbon dioxide generated (Col 2 lines 58-65). This decreases the amount of bubbles present in the final polymer – which is useful in the production of extruded hoses (Col 8 lines 44-56).

13. Therefore, it would have been obvious to extrude the modified polyurethane of Satokichi et al into a hose since Mowrer et al teach it as useful application for silane functional

Art Unit: 1796

polyurethane. Additional motivation to utilize the polyurethane of Satokichi et al as a hose is that Satokichi et al teach the relied upon composition exhibits "excellent weatherability" – desirable in hoses having external applications, and finally in obviousness rejections based on close similarity in chemical structure, the necessary motivation to make a claimed compound and thus the prima facie case of obviousness, rises from the expectation that compounds similar structure will have similar properties. *In re Gyurick*, 596 F.2d 1012, 201 USPQ 552 (CCPA 1979). Finally, the examiner has taken the position that the physical structure of a "hose" to also applies to "cable sheathing."

14. **Regarding claim 5:** Satokichi et al teach silane functional polyurethane is crosslinked in the presence of Lewis base or Lewis acid catalyst (Paragraph 42).

#### **Obviousness Rejection II**

15. **Claims 4-5, 7, and 17-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Satokichi et al (JP 11-228833) in view of Shah et al (U.S. Patent 5,714,257).

16. **Regarding claim 4 and 7:** As discussed in paragraph 3, Satokichi et al teach moisture curable, silane functional, thermoplastic polyurethane, however, Satokichi et al fail to fiber spun applications.

17. Shah et al also teach modified polyurethane having terminal silane groups, wherein said polyurethane is cured via exposure to moisture (Abstract; col 1 lines 51-61). In particular, patentees explain that since these cured compositions exhibit superior stretch and recovery characteristics, they are useful in the production of spun elastomeric fibers (Col 2 lines 21-24).

18. Therefore, it would have been obvious to spin fibers based on the modified polyurethane of Satokichi et al since Shah et al teach fiber spinning is a useful application for such

Art Unit: 1796

polyurethane because said polyurethane exhibits superior elastomeric behavior. Moreover, in obviousness rejections based on close similarity in chemical structure, the necessary motivation to make a claimed compound and thus the prima facie case of obviousness, rises from the expectation that compounds similar structure will have similar properties. *In re Gyurick*, 596 F.2d 1012, 201 USPQ 552 (CCPA 1979).

19. **Regarding claim 5:** Satokichi et al teach silane functional polyurethane is crosslinked in the presence of Lewis base or Lewis acid catalyst (Paragraph 42).

20. **Regarding claims 17-20:** Although not explicitly disclosed by the prior art, based on an analogous composition and application, one of ordinary skill would reasonably expect the fiber rendered obvious by the prior art to exhibit the same properties as claimed.

### **Obviousness Rejection III**

21. **Claims 1-2, 6, 12-14, and 21-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lagneaux et al (2002/0169255) in view of Satokichi et al (JP 11-228833).

22. **Regarding claims 1 and 6:** Lagneaux et al teach silane modified polyurethane that is produced by treating a (D) thermoplastic polyurethane (TPU) with a (E) silane containing compound (Abstract; paragraphs 27-28). However, Lagneaux et al fail to teach a two component system comprising isocyanate-functional silane compound + TPU. Instead, Lagneaux et al teach a three component system comprising (D) isocyanate-reactive TPU, (E) isocyanate-reactive silane compound, and (F) diisocyanate.

23. Nevertheless it would have been obvious to arrive at the claimed limitations since, as discussed in paragraph 3, Satokichi et al teach the production of silane modified TPU using only a two-component system – i.e. (A) TPU and (B) isocyanate-functional silane. Moreover, one

Art Unit: 1796

would be motivated to utilize said two component system since it allows the user to eliminate a reaction step – i.e. separately reacting diisocyanate with the TPU before the addition of the silane compound – thereby decreasing the amount of time needed to complete the silane modification.

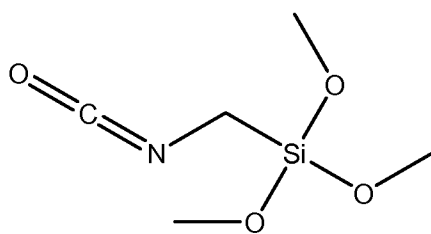
24. **Regarding claims 2 and 12-14:** As discussed in paragraphs 21 and 22, Lagneaux et al in view of Satokichi et al render obvious silane modified TPU. Moreover, Satokichi et al teach in paragraph 39 that the isocyanate-functional silane compound is: gamma-isocyanatopropyltrimethoxysilane and/or gamma-isocyanatopropyl triethoxysilane.

25. **Regarding claims 21-22:** Paragraph 33 of Lagneaux et al teach that the crosslinking agent is present between 0.1 and 30 wt% by weight of the TPU – this overlaps applicants' claimed range when using the preferred isocyanate-functional silane compounds of Satokichi et al:

Chemical Formula:  $C_5H_{11}NO_4Si$ 

Exact Mass: 177.05

Molecular Weight: 177.23



isocyanatomethyltrimethoxysilane

- a.  $0.001 \text{ mol} * 177.23 \text{ g/mol} = .17723 \text{ grams}$
- b.  $.01 \text{ mol} * 177.23 \text{ g/mol} = 1.7723 \text{ grams}$
- c.  $0.2 \text{ mol} * 177.23 \text{ g/mol} = 35.446 \text{ grams}$

26. Therefore, using these amounts of component (B) with 100 grams of thermoplastic polyurethane:



- a. @ 0.001 mol:  $0.17723 / (100) = 0.1772 \text{ wt\%}$
- b. @ 0.01 mol:  $1.7723 / (100) = 1.77 \text{ wt\%}$
- c. @ 0.2 mol:  $35.446 / (100) = 35.44 \text{ wt\%}$

27. Thus applicants' claimed mole range corresponds to a wt% range of 0.177 wt% to 35.44 wt% - specifically 1.77 wt% to 35.44 wt% - which is satisfied by the 0.1 to 30 wt% of Lagneaux et al.

#### **Obviousness Rejection IV**

28. **Claims 4-5 and 8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lagneaux et al (2002/0169255) in view of Satokichi et al (JP 11-228833) and Mowrer et al (U.S. Patent 5,760,155).

29. **Regarding claims 4 and 8-9:** Aforementioned in paragraphs 21 and 22, Lagneaux et al in view of Satokichi et al render obvious moisture curable, silane functional, extruded thermoplastic polyurethane, however, there is no mention of said polyurethane being extruded into hose or cable sheathing (Lagneaux et al; paragraphs 43-48).

30. Mowrer et al also teach modified polyurethane having terminal silane groups, wherein said polyurethane is cured via exposure to moisture (Abstract). Since the polymer cures by hydrolysis of the alkoxysilane end groups, there is less carbon dioxide generated (Col 2 lines 58-65). This decreases the amount of bubbles present in the final polymer – this reduction in bubbles renders the modified polyurethane as being useful in the production of extruded hoses (Col 8 lines 44-56).

31. Therefore, it would have been obvious to produce hoses from the polyurethane of Lagneaux et al since Mowrer et al teach it as useful application for analogous polyurethane, and

Art Unit: 1796

in obviousness rejections based on close similarity in chemical structure, the necessary motivation to make a claimed compound and thus the prima facie case of obviousness, rises from the expectation that compounds similar structure will have similar properties. *In re Gyurick*, 596 F.2d 1012, 201 USPQ 552 (CCPA 1979). Finally, the examiner has taken the position that the physical structure of a "hose" to also applies to "cable sheathing."

32. **Regarding claim 5:** While Lagneaux et al fail to teach the compounds of claim 5, it would have been obvious to include them since Satokichi et al teach them as useful curing catalyst for silane functional polyurethane (Satokichi et al; paragraph 42).

#### **Obviousness Rejection V**

33. **Claims 4-5, 7, and 17-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lagneaux et al (2002/0169255) in view of Satokichi et al (JP 11-228833) and Shah et al (U.S. Patent 5,714,257).

34. **Regarding claim 4 and 7:** As discussed in paragraphs 21 and 22, Lagneaux et al in view of Satokichi et al render obvious silane functional thermoplastic polyurethane that is moisture curable, however, Satokichi et al fail to disclose the modified polyurethane being spun in to fibers.

35. Shah et al also teach modified polyurethane having terminal silane groups, wherein said polyurethane is cured via exposure to moisture (Abstract; col 1 lines 51-61). In particular, patentees explain that since these cured compositions exhibit superior stretch and recovery characteristics, they are useful in the production of spun elastomeric fibers (Col 2 lines 21-24).

36. Therefore, it would have been obvious to spin fibers based on the modified polyurethane of Lagneaux et al since Shah et al teach fiber spinning is a useful application for such

Art Unit: 1796

polyurethane because said polyurethane exhibits superior elastomeric behavior. Moreover, in obviousness rejections based on close similarity in chemical structure, the necessary motivation to make a claimed compound and thus the prima facie case of obviousness, rises from the expectation that compounds similar structure will have similar properties. *In re Gyurick*, 596 F.2d 1012, 201 USPQ 552 (CCPA 1979).

37. **Regarding claim 5:** While Lagneaux et al fail to teach the compounds of claim 5, it would have been obvious to include them since Satokichi et al teach them as useful curing catalyst for silane functional polyurethane (Satokichi et al; paragraph 42).

38. **Regarding claims 17-20:** Although not explicitly disclosed by the prior art, based on an analogous composition and application, one of ordinary skill would reasonably expect the fiber rendered obvious by the prior art to exhibit the same properties as claimed.

#### ***Response to Arguments***

39. Applicant's arguments with respect to claims 1-2, 4-9, 12-14, and 17-22 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

40. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENJAMIN J. GILLESPIE whose telephone number is (571)272-2472. The examiner can normally be reached on 8am-5:30pm.

41. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1796

42. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Supervisory Patent Examiner, Art Unit 1796

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Examiner, Art Unit 1796